OPERATIONAL HIGH RESOLUTION SOIL MOISTURE FOR AGRICULTURAL APPLICATIONS

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The purpose of this talk is to present the status and results from two projects that aim to use high resolution soil moisture operationally for agricultural applications.

The first one (SMELLS) aims to improve current desert locust early warning systems by introducing high resolution soil moisture (1km) based on SMOS disaggregated soil moisture.

Plagues of desert locusts, Schistocerca gregaria, have threatened agricultural production in Africa, the Middle East, and Asia for centuries. The livelihood of at least one-tenth of the world's human population can be affected by swarms of this insect. Currently, desert locust center use precipitation and NDVI index to forecast the areas with highest potential of desert locust breeding. To be able to take earlier the decision to send survey teams, one solution is to have timely information about soil moisture, which precedes vegetation. Our results show that soil moisture correlates well with desert locust presence and can explain current situation in Mauritania.

The other project (REC) proposes a solution to the need of root-zone soil moisture at the crop scale for irrigation management.

REC is based on an innovative operational algorithm that will allow for the first time to: 1) to map root zone soil moisture on a daily basis at the field scale and 2) to quantitatively evaluate the different components of the water budget at the field scale from readily available remote sensing data.

The methodology relies on the coupling between a surface model representing the water fluxes at the land surface-atmosphere interface (infiltration, evaporation, transpiration) and in the soil (drainage), and remote sensing data composed of land surface temperature, and near-surface soil moisture retrieved from microwave radiometers and radars.
These estimates will be integrated in an irrigation management system that will be used to trigger irrigation.